UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/714,179	11/14/2003	Stefano Cervini	03-LJ-064	9391

7590 03/17/2009

Lisa K. Jorgenson, Esq.
STMicroelectronics, Inc.
1310 Electronics Drive
Carrollton, TX 75006

EXAMINER	
KAWSAR, ABDULLAH AL	
ART UNIT	PAPER NUMBER
2195	
MAIL DATE	DELIVERY MODE
03/17/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/714,179	CERVINI, STEFANO	
	Examiner	Art Unit	
	ABDULLAH AL KAWSAR	2195	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 December 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7,9-21 and 23-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,9-21 and 23-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-7, 9-21 and 23-28 are pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-3, 6-7, 9-10, 13-17, 20-21, 23-24, 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilkinson et al.(Wilkinson) US Patent no. 6094715, in view of Lorie et al.(Lorie) US Patent No. 4435758.

4. As per claim 1, Wilkinson teaches the invention as claimed including an apparatus for executing at least one single multiple data(SPMD) program in a microprocessor, said apparatus comprising:

a micro single instruction multiple data (SIMD) unit associated with a microprocessor (col 7, lines 25-27); and

a job buffer(BCI buffer) having an output coupled to an input of said SIMD unit(PME) (col 24, lines 49-55), and wherein a job is a combination of program and an input data-set (col 24, lines 9-17; lines 34-47; col 33, lines 51-65 through col 34, lines 1-7).

Wilkinson does not specifically disclose wherein said job buffer dynamically bundling jobs into a task based on a control flow equivalence of said jobs and allocates said task to said

micro SIMD unit, said control flow equivalence including concurrent execution of an instruction stream by said plurality of jobs.

However, Lorie teaches wherein said job buffer dynamically bundling jobs into a task based on a control flow equivalence of said jobs and allocates said task to said micro SIMD unit, said control flow equivalence including concurrent execution of an instruction stream by said plurality of jobs (figure 1;col 8, lines 36-69 through col 9, lines 1-5; col 1, lines 32-45; col 3, lines 42-48).

5. It would have been obvious to a person of ordinary skill in art at the time of invention was made to incorporate the teaching of Lorie into method of Wilkinson to dynamically bundle the jobs into a task based on control flow equivalence and concurrent execution of the instruction stream. The modification would have been obvious because one of the ordinary skills of the art would execute the job bundled with same control flow to minimize the inter-processor communication.

6. As per claim 2, Wilkinson teaches said micro SIMD unit is capable of sending job status information to said job buffer (col 73, lines 1-4; col 48, lines 28-30).

7. As per claim 3, Wilkinson teaches said at least one SPMD program comprises a plurality of input data streams having moderate diversification of control flows (col 8, lines 25-29).

8. As per claim 6, Wilkinson teaches said apparatus executes a plurality of SPMD programs and wherein each SPMD program of said plurality of SPMD programs is executed on a number of input data streams (col 8, lines 19-2).

9. As per claim 7, Wilkinson teaches said number of input data streams is greater than a program granularity threshold (col 41, lines 24-36).

10. As per claim 9, Lorie teaches said apparatus performs job clustering to form a job bundle in which each job in said job bundle has an equivalent control flow (col 1, lines 32-45).

11. As per claim 10, Wilkinson teaches said apparatus performs said job clustering based on a job processing status of said jobs in said job bundle (col 21, lines 9-11).

12. As per claim 13, Lorie teaches said apparatus maximizes a size of a job cluster by selecting tasks for execution in which a job processing status of each of said tasks is complete (col 8, lines 51-67).

13. As per claim 14, Wilkinson teaches said apparatus executes a data loading phase for a task before said apparatus executes a task execution phase for said task (col 24, lines 2-8; lines 17-26).

14. Claims 15-17, 20 and 21 are system claims of claims 1-3, 6 and 7 above. They are therefore rejected under the same rational.

15. As per claims 23, 24, 27 and 28, they have similar limitations as of claims 9, 10, 13 and 14 above. Therefore, they are therefore rejected under the same rational of claims 9, 10, 13 and 14 above.

16. Claims 4, 5, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilkinson et al.(Wilkinson) US Patent no. 6094715, in view of Lorie et al.(Lorie) US Patent No. 4435758, as applied to claims 1 and 15 above, and in view of Pechanek et al. US Patent No. 6,470,441 B1.

17. As per claim 4, Wilkinson does not specifically discloses apparatus executes said at least one SPMD program once for each input data stream of said plurality of input data streams.

18. However, Pechanek teaches said apparatus executes said at least one SPMD program once for each input data stream of said plurality of input data streams (col 4, lines 62-65).

19. It would have been obvious to a person of ordinary skill in art at the time of invention was made to incorporate the teaching of Pechanek into combined method of Wilkinson and Lorie to execute SPMD once for each data stream. The modification would have been obvious because

one of the ordinary skills of the art would have a SPMD program execution once for each data input stream as it would reduce the latency of process execution.

20. As per claim 5, Wilkinson teaches said apparatus generates an instruction stream for each input data stream of said plurality of input data streams (col 8, lines 25-28).

21. As per claims 18 and 19, they have similar limitations as of claims 4 and 5 above. Therefore, they are therefore rejected under the same rational of claims 4 and 5 above.

22. Claims 11, 12, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilkinson et al.(Wilkinson) US Patent no. 6094715, in view of Lorie et al.(Lorie) US Patent No. 4435758, as applied to claims 1 and 15 above, and further in view of "Multi-thread VLIW processor architecture for HDTV decoding" by Hansoo Kim(Kim).

23. As per claim 11, Wilkinson and Lorie do not specifically disclose forces a task to terminate at a point where a job control path might fork by placing a code-stop.

24. However, Kim teaches said apparatus forces a task to terminate at a point where a job control path might fork by placing a code-stop in said task (page 3, col 1, lines 3-8, "the program can …… entries exceeds a predefined number.")

25. Therefore, it would have been obvious to a person of ordinary skill in art at the time of invention was made to incorporate the teaching of Kim into the combined method of Wilkinson and Lorie to have a task termination point to switch task. The modification would have been obvious because one of the ordinary skills of the art would have a task switch to fulfill special conditions of system execution and prioritize execution.

26. As per claim 12, Kim teaches said apparatus minimizes a required number of code-stops to be placed in said task by excluding from code-stop placement each control flow statements that is equivalent to a select instruction (page 3, col 1, lines 3-8, "the program can …….. exceeds a predefined number.").

27. As per claims 25 and 26, they have similar limitations as of claims 11 and 12 above. Therefore, they are therefore rejected under the same rational of claims 11 and 12 above.

Response to Argument

28. Applicant's arguments filed 12/29/2008 have been fully considered but they are not persuasive.

29. In the remarks applicant argues that:

(1) Wilkinson fails to teach "a job is a combination of a program and an input data-set".

30. Examiner respectfully disagree to applicant:

i. As to points (1), applicant supports his argument with mentioning that Wilkinson teaches "buffer a single instruction and/or data word," but does not describe a job buffer, where a job is a combination of a program and an input data-set. Examiner respectfully disagrees with the applicant. Wilkinson teaches a PME(SIMD unit) which is capable of executing in SIMD mode. When the PME is executing in SIMD mode it receives instruction through the BCI bus. BCI buffers(job buffer) the data until PME have executed the instructions which means the BCI buffer sends the instructions to the PME through the BCI bus and the output of the BCI buffer broadcasts the instructions to the PME input for processing through the BCI bus (Wilkinson, col 24, lines 48-55). Wilkinson also teaches that the I/O data must be broadcasted or gathered from all the PMEs where the broadcast data include command, program and data. During operations the BCI(job buffer) section collects data(buffer) and transfers them to specified PME's for processing (col 24, lines 35-47; col 33, lines 51-65 through col 34, lines 1-7)

Conclusion

31. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

32. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

33. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ABDULLAH AL KAWSAR whose telephone number is (571)270-3169. The examiner can normally be reached on 7:30am to 5:00pm, EST.

34. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng Ai T. An can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

35. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Meng-Ai An/
Supervisory Patent Examiner, Art Unit 2195

/Abdullah-Al Kawsar/
Examiner, Art Unit 2195